

We Claim:

1. A method for making and contacting a doping region of a semiconductor component, which comprises the steps of:

providing a silicon substrate having a substrate surface;

introducing a dopant into the silicon substrate resulting in the doping region being formed at the substrate surface in the substrate;

depositing and patterning an insulating layer on the substrate surface, a surface region of the doping region being uncovered;

depositing a metal-containing layer on the insulating layer and the surface region;

processing the substrate during a first step in a process chamber at a first temperature in a first atmosphere containing H_2 , for a first time duration, resulting in metal silicide being produced from a part of the metal-containing layer and a part of the doping region; and

subsequently processing the substrate during a second step at a second temperature in a second atmosphere containing less than 10% H_2 and more than 90% N_2 , for a second time duration to

convert a remaining part of the metal-containing layer into metal nitride.

2. The method according to claim 1, which further comprises setting the first time duration to be shorter than the second time duration.

3. The method according to claim 1, which further comprises forming the metal-containing layer from a material selected from the group consisting of titanium, tantalum, cobalt, molybdenum, palladium, platinum, nickel and tungsten.

4. The method according to claim 1, which further comprises using an ionized metal plasma method at a temperature between 180° C and 220° C for depositing the metal-containing layer.

5. The method according to claim 1, which further comprises using a wet-chemical cleaning process for cleaning the uncovered surface region.

6. The method according to claim 1, which further comprises using an ionized metal plasma method at a temperature of 200° C \pm 5° C for depositing the metal-containing layer.

7. The method according to claim 1, which further comprises during the first step, carrying out the processing of the substrate at a temperature of 550° C.

8. The method according to claim 1, which further comprises during the first step, forming the first atmosphere to contain N₂ with a proportion of less than 25%.

9. The method according to claim 1, which further comprises during the second step, forming the second atmosphere to contain a proportion of 4% H₂ and a proportion of 96% N₂.

10. The method according to claim 9, which further comprises during the second step, carrying out the processing of the substrate at the second temperature being 550° C.